

In Leonardo's Own Words...

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"PARAGONE," OR, FIRST PART OF THE BOOK ON PAINTING

Painting and Science. *Which Science is Mechanical and Which is Not?* They say knowledge born of experience is mechanical, but that knowledge born and consummated in the mind is scientific, while knowledge born of science and culminating in manual work is semimechanical. But to me it seems that all sciences are vain and full of errors that are not born of experience, mother of all certainty, and that are not tested by experience, that is to say, that do not at their origin, middle, or end pass through any of the five senses.

All true sciences are the result of experience which has passed through our senses, thus silencing the tongue of litigants. Experience does not feed investigators on dreams, but always proceeds from accurately determined first principles, step by step in true sequences, to the end; as can be seen in the elements of mathematics founded on numbers and measures called arithmetic and geometry, which deal with discontinuous and continuous quantities with absolute truth.

If you say that these true sciences that are founded on observation must be classed as mechanical because they do not accomplish their end, without manual work, I reply that all arts that pass through the hands of scribes are in the same position, for they are a kind of drawing which is a branch of painting.

The scientific and true principles of painting first determine what is a shaded object, what is direct shadow, what is cast shadow, and what is light, that is to say, darkness, light, colour, body, figure, position, distance, nearness, motion, and rest. These are understood by the mind alone and entail no manual operation; and they constitute the science of painting which remains in the mind of its contemplators; and from it is born the actual creation, which is far superior in dignity to the contemplation or science which precedes it.

How Painting Embraces all the Surfaces of Bodies and Extends to These. Painting extends only to the surface of bodies; perspective deals with the increase and decrease of bodies and of their colouring, because an object as it recedes from the eye loses in size and colour in proportion to the increase of distance.

Therefore painting is philosophy, because philosophy deals with the increase and decrease through motion as set forth in the above proposition; or we may reverse the statement and say that the object seen by the eye gains in size, importance, and colour as the space interposed between it and the eye which sees it diminishes.

Painting and Poetry. *The Difference Between Painting and Poetry.* Painting is poetry which is seen and not heard, and poetry is a painting which is heard but not seen. These two arts, you may call them both either poetry or painting, have here interchanged the senses by which they penetrate to the intellect. Whatever is painted must pass by the eye, which is the nobler sense, and whatever is poetry must pass through a less noble sense, namely, the ear, to the understanding....If in the painting the actions of the figures are in every case expressive to the purpose in their minds, the beholder, though born deaf, is

sure to understand what is intended, but the listener born blind will never understand the things the poet describes which reflect honour on the poem, including such important parts as the indication of gestures, the compositions of the stories, the description of beautiful and delightful places with limpid waters through which the green bed of the stream can be seen, and the play of the waves rolling through meadows and over pebbles, mingling with blades of grass and with playful fishes, and similar subtle detail which may as well be addressed to a stone as to a man born blind who never in his life has seen what makes the beauty of the world, namely, light, shade, colour, body, figure, position, distance, nearness, motion, and the rest—these ten ornaments of nature.

SELECTIONS FROM THE ORIGINAL MANUSCRIPTS

Prolegomena and General Introduction to the Book on Painting. *On the Sections of Painting.* The first thing in painting is that the objects it represents should appear in relief, and that the grounds surrounding them at different distances should appear to extend (three dimensionally) right into the wall on which they are painted, with the help of the three branches of perspective, which are: the diminution of the forms of the objects; the diminution in their magnitude; and the diminution in their colour. And of these three classes of perspective the first results from [the structure of] the eye, while the other two are caused by the atmosphere which intervenes between the eye and the objects seen by it. The second essential in painting is appropriate action and a due variety in the figures, so that the men may not all look like brothers, etc.

Six Books on Light and Shade. *Introduction*

...Shadow is the obstruction of light. Shadows appear to me to be of supreme importance in perspective, because without them opaque and solid bodies will be ill defined; that which is contained within their outlines and their boundaries themselves will be ill understood unless they are shown against a background of a different tone from themselves. And therefore in my first proposition concerning shadow I state that every opaque body is surrounded and its whole surface enveloped in shadow and light.

Perspective of Colour and Aerial Perspective. *Of Aerial Perspective.* There is another kind of perspective which I call Aerial Perspective, because by the atmosphere we are able to distinguish the variations in distance of different buildings, which appear placed on a single line...You know that in an atmosphere of equal density the remotest objects seen through it, as mountains, in consequence of the great quantity of atmosphere between your eye and the—appear blue and almost of the same hue as the atmosphere itself when the sun is in the East...Those you wish to look farther away you must make proportionately bluer; thus if one is to be five times as distant, make it five times bluer.

...Take care that the perspective of colour does not disagree with the size of your objects, that is to say; that the colours diminish from their natural [vividness] in proportion as the objects at various distances diminish from their natural size.

A Way of Developing and Arousing the Mind to Various Inventions. I cannot forbear to mention among these precepts a new device for study which, although it may seem but trivial and almost ludicrous, is nevertheless extremely useful in arousing the mind to various inventions. And this is, when you look at a wall spotted with stains, or with a mixture of stones, if you have to devise some scene, you may discover

a resemblance to various landscapes, beautiful with mountains, rivers, rocks, trees, plains, wide valleys and hills in varied arrangement; or, again, you may see battles and figures in action; or strange faces and costumes and an endless variety of objects, which you could reduce to complete and well-drawn forms. And these appear on such walls confusedly, like the sound of bells in whose jangle you may find any name or word you choose to imagine.

Of Selecting the Light which Gives Most Grace to Faces. If you should have a courtyard that you can at pleasure cover with a linen awning that light will be good. Or when you want to take a portrait, do it in dull weather, or as evening falls, making the sitter stand with his back to one of the walls of the courtyard. Note the streets, as evening falls, the faces of the men and women, and when the weather is dull, what softness and delicacy you may perceive them in. Hence, O Painter! Have a court arranged within the walls tinted black and a narrow roof projecting within the walls. It should be 10 *braccia* wide and 20 *braccia* long and 10 *braccia* high and covered with a linen awning when the sun is shining; or else paint a work towards evening or when it is cloudy or misty, and this is a perfect light.

How the Mirror is the Master (And Guide) of Painters. When you want to see if your picture corresponds throughout with the objects you have drawn from nature, take a mirror and look in that at the reflection of the real things, and compare the reflected image with your picture, and consider whether the subject of the two images duly corresponds in both, particularly studying the mirror. You should take the mirror for your guide—that is to say a flat mirror—because on its surface the objects appear in many respects as in a painting.

Philosophy and History of the Art of Painting. *He who Despises Painting Loves Neither Philosophy nor Nature.* If you despise painting, which is the sole imitator of all visible works of nature, you will certainly despise a subtle invention which brings philosophy and subtle speculation to the consideration of the nature of all forms—the sky and the land, plants, animals grass, and flowers—which are surrounded by shade and light. And truly this is a science and the legitimate issue of nature; for painting is born of nature—or, to speak more correctly, we shall call it the grandchild of nature; for all visible things were brought forth by nature, and these her children have given birth to painting. Hence we may justly call it the grandchild of nature and related to God.

That Sculpture is Less Intellectual than Painting, and Lacks Many Characteristics of Nature... In the first place sculpture requires a certain light, that is, from above; a picture carries everywhere with it its own light and shade. Thus light and shade are essential to the sculpture, and the sculptor is aided in this by the nature of the relief which produces these of its own accord, while the painter artificially creates them by his art in the places where nature would normally produce them. The sculptor cannot diversify his work by the various natural colours of objects; painting is not defective in any particular. The sculptor when he uses perspective cannot make it in any way appear true; that of the painter can appear like a hundred miles beyond the picture itself. Their works have no aerial perspective whatever, they cannot represent transparent bodies, they cannot represent luminous bodies, nor reflected lights, nor lustrous bodies, as mirrors and the like polished surfaces, nor mists, nor dark skies, nor an infinite number of things which need not be told in fear of tedium.

That Painting Declines and Deteriorates from Age to Age, When Painters have no other Standard than Painting Already Done. Hence the painter will produce pictures of small merit if he takes for his standard the pictures of others, but if he will study from natural objects he will bear good fruit.

ANATOMY

(footnote: According to Vasari, Leonardo studied with Marc Antonio della torre, the learned anatomist who taught at the universities of Padua and Pavia. The dissection of dead human bodies for purposes of medical research was practiced in Italy from the thirteenth century. The dissection of corpses was permitted by the Church but a brief was required.)

...And you, who say that it would be better to watch an anatomist at work than to see these drawings, you would be right, if it were possible to observe all the things which are demonstrated In such drawings in a single figure, in which you, with all your cleverness, will not see nor obtain knowledge of more than some few veins, to obtain a true and perfect knowledge of which I have dissected more than ten human bodies, destroying all the other members, and removing the very minutest particles of the flesh by which these veins are surrounded, without causing them to bleed, excepting the insensible bleeding of the capillary veins; and as one single body would not last so long, since it was necessary to proceed with several bodies by degrees, until I came to an end and had a complete knowledge; this I repeated twice, to learn the differences.